
A stable cranial neural crest cell line from mouse.

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Public Summary:

Cranial neural crest cells give rise to ectomesenchymal derivatives such as cranial bones, cartilage, smooth muscle, dentin, as well as melanocytes, corneal endothelial cells, and neurons and glial cells of the peripheral nervous system. Previous studies have suggested that although multipotent stem-like cells may exist during the course of cranial neural crest development, they are transient, undergoing lineage restriction early in embryonic development. We have developed culture conditions that allow cranial neural crest cells to be grown as multipotent stem-like cells. With these methods, we obtained 2 independent cell lines, Og-1 and i10-1, which were derived from mass cultures of Wnt1-Cre; R26R-GFP-expressing cells. These cell lines can be propagated and passaged indefinitely, and can differentiate into osteoblasts, chondrocytes, smooth muscle cells, and glial cells. Whole-genome expression profiling of Og-1 cells revealed that this line stably expresses stem cell markers (CD44, Sca-1, and Bmi1) and neural crest markers (AP-2alpha, Twist1, Sox9, Myc, Ets1, Dlx1, Dlx2, Crabp1, EphA2, and Itgb1). Og-1 cells are capable of contributing to cranial mesenchymal (osteoblast and smooth muscle) neural crest fates when injected into E13.5 mouse cranial tissue explants and chicken embryos. These results suggest that Og-1 cells represent multipotent mesenchymal cranial neural crest cells. The Og-1 cell line should serve as a useful tool for investigating the molecular properties of differentiating cranial neural crest cells.

Scientific Abstract:

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